REMARKS

I. Allowable Subject Matter

Claims 5, 6, 11, 12, 13 and 14 were found to contain allowable subject matter according to paragraph 7 on page 6 of the Office Action. Claim 6 depended on claim 5. Claims 12, 13 and 14 depended on claim 11.

Claim 5 was amended to include the features and limitations of claim 1, so that it can be allowed in response to this amendment. Similarly claim 11 was amended to include the features and limitations of claims 1 and 7, so that it too can be allowed in response to this amendment.

However claim 1 has also been amended to further distinguish its subject matter from the cited prior art. The changes in claims 5 and 11 should not prejudice consideration of the changes in claim 1, which are an alternative way to arrive at an allowable independent claim.

II. Obviousness Rejection of Claims 1, 2 and 7

Claims 1, 2 and 7 were rejected under 35 USC 103 (a) as obvious over Aulich, et al (US Patent 4,133,664 – referred to as "Aulich" hereinbelow).

Claim 1 has been amended to limit the double crucible apparatus to a double crucible for drawing "core-clad" glass fibers. A core-clad glass fiber according to page 2, lines 10 to 15, of applicants' specification is a glass fiber having an inner glass core and an outer glass coating or cladding. In other

words, the inner glass core is coated or clad with another glass material. See also page 10, lines 1 to 5, and the withdrawn and canceled main method claim.

In addition to including this statement of intended use in the preamble of claim 1, the body of claim 1 has been amended to state that the inner crucible and the outer crucible are such that the core-clad glass fiber can be drawn from glass melts held in them. In other words, the dimension, materials and structure of the inner crucible and outer crucible are such that the core-clad glass fiber can be drawn from the glass melts held in them.

In contrast, Aulich discloses a double crucible apparatus for making a light conducting fiber comprising a glass core disposed in a loosely fitting cladding tube (see fig. 3 of Aulich; column 2, line 30; title; claim 1, line 2). The inner core of Aulich is loosely arranged in the outer glass cladding tube. In other words, the light conducting fiber is *not* a core-clad glass fiber, i.e. an inner glass core coated or clad with an outer glass coating, as is the case for the optical fiber produced by the double crucible apparatus of amended claim 1.

The apparatus of Aulich is structured and designed to produce the optical fiber comprising the inner glass core loosely arranged in the outer glass cladding tube, as shown in figure 3. Claim 1 of Aulich claims a double crucible apparatus comprising a first crucible for the cladding tube and a second crucible for the inner glass core. According to this claim 1 the orifice of the first crucible for the cladding tube is ring-shaped with an inner diameter that is greater than the diameter of the circular orifice of the second or inner crucible for the loosely fitting glass core. See column 7, line 9 and following in claim 1. Because of this latter

structural limitation in claim 1 of Aulich the claimed double crucible cannot produce a core-clad glass fiber comprising an inner glass core with an outer glass coating or cladding adhering or tightly fitting on the inner glass core.

In the applicants' double crucible apparatus there is no radial spacing between the inner edge of the outlet orifice of the first or outer crucible and the outer edge of the second or inner crucible so that the glass melt from the first or outer crucible will first flow on the outer wall of the outlet nozzle of the second or inner crucible and then reach the glass melt flowing from the second or inner crucible. As a result an optical fiber comprising an inner glass core coated or clad with an outer glass coating will be formed with applicants' apparatus.

This critical structural difference between applicants' double crucible apparatus has been included in claim 1 by amending claim 1 so that it has a new final paragraph, which includes this structure difference with functional wording. Functional wording at the point of novelty is acceptable in accordance with MPEP 2173.05 (g). This newly added functional wording is:

"so that the core-clad glass fiber can be drawn from the core glass melt in the inner crucible and the cladding glass melt in the outer crucible"

This wording constitutes a limitation on the dimensions and materials of the foregoing structural components recited in the claim so that the desired results, namely a core-clad glass fiber is produced by the apparatus in operation. Especially it excludes double crucibles with a radial spacing as claimed by claim 1 of Aulich, which is sufficiently large to produce the optical fiber with the inner core loosely arranged in the cladding tube.

Furthermore Aulich teaches away from the invention by stating that conventional light conductive fibers with tight-fitting cladding or comprising an inner glass core with an adherent outer glass coating should be replaced by the light conductive fibers of their invention with the loosely fitting cladding tube. In that way the problems of the conventional light conductive fibers are avoided (column 3, lines 59 to 68; column 1, line 13, to column 2, line 7).

It is well established that a reference that would lead one skilled in the art away from the claimed invention should not be used alone or in combination with other prior art references to reject the claimed invention as obvious under 35 U.S.C. 103 (a). See MPEP 2145 X. Also the Federal Circuit Court of Appeals has said:

> "That the inventor achieved the claimed invention by doing what those skilled in the art suggested should not be done is a fact strongly probative of nonobviousness." In ***Kloster Speedsteel AB v. Crucible Inc.,*** 230 U.S.P.Q. 81 (Fed. Cir. 1986), on rehearing, 231 U.S.P.Q. 160 (Fed. Cir. 1986).

Aulich teaches a double crucible structure that necessarily makes the glass inner core disposed in a loosely fitting cladding tube, while the claimed structure of applicants' amended claim makes the core-clad glass fiber, which the structure of Aulich cannot make.

In addition, there is no motivation in Aulich for one skilled in the art to use the feature that the outlet nozzle of the inner crucible extends beyond the outlet nozzle of the outer crucible that is shown in figure 1 in the embodiment shown in

figure 4. This feature shown in figure 1 apparently is merely a matter of arbitrary design choice. It is not claimed in the claims nor mentioned at all in the disclosure regarding the embodiment of figure 1 in columns 4 and 5 of Aulich. If such disclosure exists in the specification of Aulich, it is respectfully requested that the location of this disclosure should be pointed out.

There is no reason given anywhere in Aulich for extending the outlet nozzle of the inner crucible beyond that of the outer crucible. Thus there is no suggestion in Aulich that the embodiment of figure 4 should be modified in this manner. The fact that the closure 5 is associated with the embodiment of figure 1 does not provide this sort of motivation because the central or second projection 8 of this closure could easily extended in length so that the same type of closure structure could be used with the embodiment of figure 4. Thus the closure 5 does not provide any incentive for modifying the structure of the embodiment of fig. 4.

Furthermore there is a significant difference between the embodiment of fig. 4 and that of fig. 1 of Aulich. Only the embodiment of figure 4 of Aulich can make a glass cladding tube and a loosely fitting inner glass core with respective different glass compositions. In order to be able to make a core-clad glass fiber with a glass inner core with an entirely different composition from the cladding the double crucible apparatus must have two crucibles that are separately heated so that they can accommodate glass of different melting points, as claimed in applicants' amended claim 1.

Only the applicants' disclosures on page 5 of the applicants' specification provide a motivation for or teaching of extending the outlet nozzle of the inner

crucible beyond that of the outer crucible, which is indeed advantageous for glass with a steep viscosity curve or high density. This claimed structure in applicants' amended claim 1 stabilizes the glass flowing out of the outlet nozzle of the outer crucible. Note the disclosure of advantages and the relationship between the extent that the outlet nozzle of the inner crucible projects and the diameter of the outlet nozzle disclosed on page 5, line 13, to page 6, line 6, of applicants' specification.

The quantitative relationship regarding the relationship between the diameter of the outlet nozzle of the outer crucible and the extent by which the outlet nozzle of the inner crucible extends beyond that of the outer crucible is claimed in new claim 22. Basis for this claim is provided on page 6, lines 1 to 6 of applicants' specification.

It is especially important to remember that the statute requires that the source of the suggestion to modify cannot be the applicants' specification ...

> "As in all determinations under 35 U.S.C. 103, the decision-maker must bring judgment to bear. It is impermissible, however, simply to engage in a hindsight reconstruction of the claimed invention, using the applicant's structure as a template and selected elements from references to fill the gaps". ***In re Gorman***, 18 U.S.P.Q.2d 1885 (Fed. Cir. 1991).

There is no motivation or suggestion, except on pages 5 and 6 of the applicants' specification, which suggests that the outlet nozzle of the inner crucible in figure 4 of the reference should extend beyond that of the outer crucible.

For the foregoing reasons and because of the changes in amended claim 1, withdrawal of the rejection of claims 1, 2 and 7 under 35 U.S.C. 103 (a) over Aulich, et al, is respectfully requested.

III. Obviousness Rejection of Claims 1, 2 and 7

Claims 3, 4, 7 and 9 were rejected under 35 USC 103 (a) as obvious over Aulich, et al, and further in view of Tick and Oldfield.

Aulich has been summarized above.

Oldfield discloses a method of making laser glass, especially laser rods. Thus a double crucible is not required or disclosed in this reference.

Tick does disclose a method of making a core-clad glass fiber by flowing a column of liquid core glass into a quantity of liquid cladding glass while both are at a high temperature. However the apparatus used by Tick is not a double crucible apparatus; it has an entirely different structure adapted to the different method used by Tick.

Tick and Oldfield are cited for teaching components or parts with gold or gold alloy coatings, which can withstand or are resistant to molten glass materials. Also Oldfield does teach a melting crucible which is lined with a platinum alloy.

However neither Tick nor Oldfield disclose any double crucible structures for making an optical fiber comprising either a cladding tube loosely fitting around a central inner glass core or a core-clad glass fiber. Since the references do not

disclose any double crucible structures, they cannot suggest the critical difference between the double crucible structures of applicants' claim 1 and the double crucible structures of Aulich.

It is well established by many U. S. Court decisions that to reject a claimed invention under 35 U.S.C. 103 there must be some hint or suggestion in the prior art of the modifications of the disclosure in a prior art reference or references used to reject the claimed invention, which are necessary to arrive at the claimed invention. For example, the Court of Appeals for the Federal Circuit has said:

> "Rather, to establish obviousness based on a combination of elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant...Even when obviousness is based on as single reference there must be a showing of a suggestion of motivation to modify the teachings of that reference.." ***In re Kotzab***, 55 U.S.P.Q. 2nd 1313 (Fed. Cir. 2000). See also M.P.E.P. 2141

Furthermore Tick teaches against the double crucible method of making core-clad glass fiber because according to Tick the method may result in vitrification at the core cladding interface (column 1, line 63 to column 2, line 11; and column 2, lines 42 to 45).

For the foregoing reasons and because of the changes in the amended claims, withdrawal of the rejection of claims 3, 4, 7 and 9 under 35 U.S.C. 103 (a) over Aulich, et al, and further in view of Tick and Oldfield, is respectfully requested.

IV. Obviousness Rejection of Claims 8 and 10

Claims 8 and 10 were rejected under 35 USC 103 (a) as obvious over Aulich, et al, and further in view of Boen and Meerman.

Aulich has been summarized above.

Boen, et al, teaches a special cold cage structure for a crucible comprising a series of hollow segments. The crucible is used with a high or medium frequency induction coil. See abstract. Boen does not disclose any double crucible structure.

Merrman discloses a method and an apparatus for production of a glass rod using a cooled silica tube. The apparatus is generally tubular and has a heating zone and refining zone (abstract). Merrman does not disclose any double crucible structure.

Neither Boen nor Merrman disclose or suggest any double crucible structures for making an optical fiber comprising either a cladding tube loosely fitting around a central inner glass core or a core-clad glass fiber. Since the references do not disclose any double crucible structures, they cannot suggest the critical difference between the double crucible structures of applicants' claim 1 and the double crucible structures of Aulich.

For the foregoing reasons and because of the changes in the amended claims, withdrawal of the rejection of claims 8 and 10 under 35 U.S.C. 103 (a) over Aulich, et al, and further in view of Boen and Meerman, is respectfully requested.

Should the Examiner require or consider it advisable that the specification, claims and/or drawing be further amended or corrected in formal respects to put this case in condition for final allowance, then it is requested that such amendments or corrections be carried out by Examiner's Amendment and the case passed to issue. Alternatively, should the Examiner feel that a personal discussion might be helpful in advancing the case to allowance, he or she is invited to telephone the undersigned at 1-631-549 4700.

In view of the foregoing, favorable allowance is respectfully solicited.

Respectfully submitted,

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